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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 08/844,731
Filing Date: April 21, 1997
Appellant(s): BROD, STALEY A.

David L. Parker
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 4/28/2006 appealing from the Office action mailed 6/13/2005.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences, which have been decided and have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is essentially correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal in the brief is correct.

(7) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Prior Art of Record

Sobel (U. S. Patent No. 5, 780, 021)

Cummins (U. S. Patent No. 5, 019, 382)

Cummins (U. S. Patent No. 4, 462, 985)

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 8, 9, 11, 16, 17, 19 and 20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Sobel (U.S. Patent No: 5,780,021) in view of Cummins (U.S. Patent No: 5, 019, 382) and Cummins (U.S. Patent No: 4, 462, 985).

Sobel describes a method of treating or preventing an autoimmune disease, which includes insulin dependent diabetes mellitus (IDDM), which inherently would reduce blood glucose, with Type I interferon using various dosages (column 1-2). Sobel teaches that, the amount of single subtype of α-IFN or β-IFN, hybrids, analogs, or mixtures thereof administered per dose either prior to or after the onset of disease is about 1×10^5 units to about 75×10^6 units with administration being given from once per day to about once per week," (column 4, lines 10-16). In addition, Sobel teaches that amounts may be used which are less than 1×10^5 units, such as 5×10^4 units or lower (column 4, lines 15-16). Sobel teaches that doses of α-IFN lower that 400, 000 units may be used to reduce the incidence of diabetes mellitus. For example, a dose of as low as about 100, 000 units may be used effectively (column 10, lines 39-44). Sobel also discloses the prevention of the development of diabetes in DP BB (diabetes prone bio breeding) rats (column 10, lines 33-35). The reference also teaches human interferon-α (column 4, lines 37-40). See claims 1-2, 4 and column 4, lines 10+, and column 13, lines 10-30 that particularly describes oral administration. However, the

Sobel reference does not teach the specific dosages recited in the claims and the alternate dosing.

Cummins describes the oral administration of about 0.1 to about 5 IU/lb per day of interferon (U.S. Patent No: 5, 019, 382, abstract). This is equivalent to about 0.22 to about 11IU/kg. Cummins also describes that 1 unit ≅ 0.1IU (column 3, lines 54-55). The reference also teaches the treatment of autoimmune disorder (column 4, lines 19-25), as well as use of human and murine interferons (column 3, lines 45-46). Cummins also discloses a staggered administration regimen of the doses, for example one to three days' treatment per week or month (column 5, lines 51-55).

Cummins (U.S. Patent No: 4, 462, 985) teaches the oral administration in humans of 10 to 1,000 units of interferon per Kg body weight (column 9, lines 20-23 and claim 7). The reference teaches that dosages required for therapeutic effect are expected to vary widely depending on the mammal patient and condition treated, with from 10 to about 1,000 units per Kg in unit dosage form being operative (column 9, lines 20-23), thus, providing the motivation to change the dosage depending on the condition treated. Based on a body weight of 87Kg (males) or 75Kg (females) provided by the Appellant, Cummins dosages would translate to 870 to 87,000 units or 750 to 75, 000 units of interferon.

It would have been *prima facie* obvious to one of ordinary skill in the art, at the time the invention was made to practice the method of Sobel by modifying the doses as to taught by Cummins ('985) for the treatment of diabetes resulting in the claimed method because Cummins ('985) teaches that the dosages required for therapeutic

effect are expected to vary widely dependent on the mammal patient and condition treated. See MPEP § 2144.05 [R-3] II for a discussion on optimization of ranges, specifically, *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955); *Peterson*, 315 F.3d at 1330, 65 USPQ2d at 1382. One of ordinary skill in the art would have been motivated to use interferon in the doses recommended by Cummins ('985) to treat IDDM in the method of Sobelwith the expectation of success because Cummins (U.S. Patent No: 5, 019, 382) teaches the treatment of autoimmune disorder, which includes IDDM and because Cummins ('985) teach that 10-100 unit per Kg is an operative range in humans. Therefore, the instant claims are *prima facie* obvious over Sobel (U.S. Patent No: 5,780,021) in view of Cummins (U.S. Patent No: 5, 019, 382) and Cummins (U.S. Patent No: 4, 462, 985).

(10) Response to Argument

Appellant argues the rejection of claims 8, 9, 11, 16, 17, 19 and 20 based on the combination Sobel in view of Cummins ('382) and Cummins ('985) spanning pages 3-6. Briefly, Appellant argues that references of record do not teach the dosage contemplated in the instant invention. Thus, it is claimed that the Office has failed to set forth sufficient evidence to make a *prima facie* case. Appellant asserts that Sobel teaches away from the claimed interferon dose ranges. Appellant quotes from Sobel " Generally, in accordance with the present invention, the amount of single subtype of α-IFN or β-IFN, hybrids, analogs, or mixtures thereof administered per dose either prior to or after the onset of disease is about 1×10^5 units to about 75×10^6 units with

administration being given from once per day to about once per week," (column 4, lines 10-16). Appellant contends that this at the minimum dose is over three times higher than that which is recited in the claims at issues. However, further reading of Sobel indicates that, contrary to Appellant's assertions, much smaller dosages are contemplated. For example, Sobel teaches that amounts may be used which are less than 1×10^5 units, such as 5×10^4 units or lower (column 4, lines 15-16). Appellant also contends that analysis of the studies in Figures 1 and 2 of Sobel indicates that when administered in a similar fashion, 400, 000 units of α-IFN was more effective at preventing IDDM than 100, 000 units of α-IFN. Thus, it is claimed that a review of Sobel would suggest to one of skill in the art that, if anything, higher doses of interferon might be preferred to treat IDDM. Thus, Appellant asserts that Sobel alone does not teach the oral α-IFN dose range of the claims nor does it suggest such a range. In response to Appellant's arguments against the references individually, one cannot show nonobviousness by attacking refrences invidually where rejections are based on combinations of references. See *In re Keller,* 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re* Merck & Co., 800 F.2nd 1091, 231 USPQ 375 (Fed. Cir. 1986). However, Sobel discloses that doses of α-IFN lower that 400, 000 units may be used to reduce the incidence of diabetes mellitus. For example, a dose of as low as about 100, 000 units may be used effectively (column 10, lines 39-44).

In addition, Appellant argues that Cummins '985 reference is directed to the treatment of diseases that are not related to IDDM and thus the reference is not relevant to the instant invention. However, if Cummins '985 taught IDDM, the rejection would

have been made as an anticipation rejection. Further, Cummins '985 patent was cited for providing a suitable dosage range for interferon administration to humans (Appellant has not disputed this fact). Appellant also argues that Cummins '985 is not directed to the use of interferon for controlling or suppressing an autoimmune disease such as IDDM. Rather it is asserted that the reference concerns oral interferon administration for enhancing immune response. While Cummins '985 experiments involved the treatment of cancer (breast cancer and melanoma) the reference also discloses that "in addition to use in antiviral and antitumor therapy, interferon has rather recently been noted to possess immunomodulatory effects, both immunopotentiating and immunosuppressive in nature" (column 3, lines 33-35). Thus, indicating a role for interferon in autoimmune suppression and providing the motivation to combine the teachings of Sobel and Cummins '985.

Appellant also argues that Cummins '382 teaches oral interferon dose ranges that are an order of magnitude lower than those of the instant claims for treating autoimmune disease. Thus, it is argued that in view of Cummins'382, one of skill in the art could not reasonably expect success using the higher dose ranges as recited in the claims (page 5 of the response). Contrary to Appellant's assertion, the dosages disclosed are 0.1 to about 5 IU/lb per day (abstract), which is equivalent to about, 0.22 to about 11IU/Kg. In addition, Cummins '382 has described that 1 unit $\cong$ 0.1IU (column 3, lines 54-55). Therefore, the interferon dosage described in Cummins '382 is equivalent to 2.2 to about 110 units/Kg per day. Based on a body weight of 87Kg (males) or 75Kg (females) provided by the Appellant, this translates to 191.4 units to

about 9570 units per day for adult males and a dose of 165 units to about 8250 units per day for adult females. Cummins '382 also discloses that the interferon is administered 2-3 times daily for five days (column 8, lines 20-28) for treatment purposes. Therefore the dosages contemplated by Cummins '382 encompass the dosage disclosed in the instant claims and does not teach away from the ranges contemplated in the instant claims as asserted by the Appellant (see *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985); *In re Peterson*, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir. 2003)). Thus, it would have been *prima facie* obvious to one of ordinary skill in the art, at the time the invention was made to modify the interferon doses of Sobel to those taught by Cummins '985 with expectation of treating IDDM patients. One of ordinary skill in the art would have been motivated to use interferon in the doses recommended by Cummins '985 to treat IDDM with the expectation of success because Cummins '382 teaches the treatment of autoimmune disorder, which includes IDDM with interferon alpha and Cummins ('985) teaches a range of dosages which are operative in humans and that dosages may vary dependent on the conditions treated.

For above reasons, it is believed that the rejections should sustained.

(11) Related Proceedings Appendix

Appellant has identified the related appeals and interferences, which have been decided and have a bearing on the decision in the pending appeal is contained in the brief. Appellant has also provided the copies of the decisions in the brief.

Respectfully submitted

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Examiner, Art Unit 1647

May 24, 2007

Christine Saoud, Ph.D

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